

Chemical Reactions Introduction

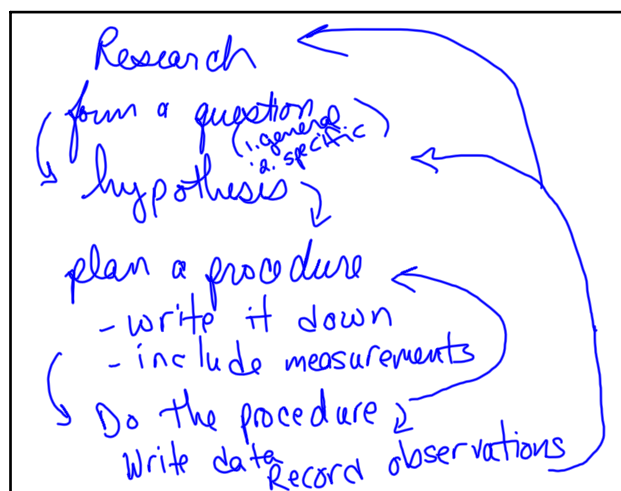
Reactants:

Sodium bicarbonate

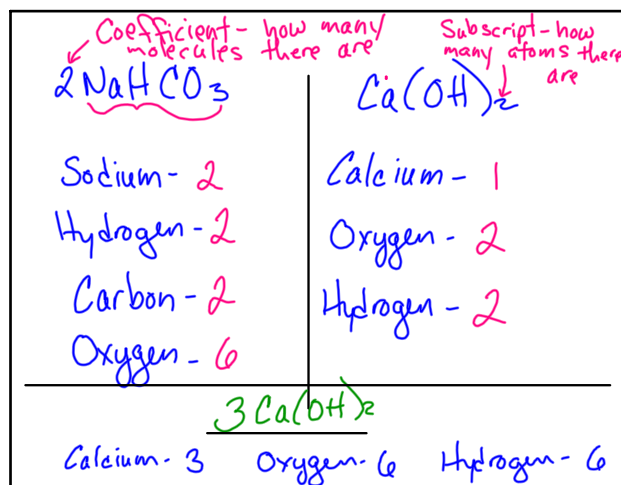
Calcium chloride

Water

Bromothymol blue



3 test tubes
 temperature sensor
 weighing papers
 little beaker



Reactants	Observations
$\text{CaCl}_2 + \text{B.B.}$	
$\text{CaCl}_2 + \text{NaHCO}_3$ B.B.	
$\text{NaHCO}_3 + \text{B.B.}$	
$\text{NaHCO}_3 + \text{CaCl}_2$	
$\text{CaCl}_2 + \text{NaHCO}_3 + \text{H}_2\text{O}$	

$\text{H}_2\text{O} + \text{NaHCO}_3$	
$\text{H}_2\text{O} + \text{CaCl}_2$	

Observations

Masses

Volumes of liquids

Temperatures

Color

Bubbles or no bubbles

Explosions

Empty Canister — g

1-5 pellets

Canister — g

Subtract
Canister — gNot Great

No, because

1. Salt is not the same as sodium.
↳ compound
2. Sulfur
↳ element

3. Rocket fuel
 H_2 ? O_2 ?Spark
hmm....4. Lightbulbs
+
Oxygen5. New Elements
what makes an
element unique.6. Classification -
group, sort,
characterizeNot Great -
Short sentences
no support
"for example"Chemical ReactionI no
a

Reactants
Interacts like the atoms

nice	action	time	lie
trace	rate	crime	tie
react	late	not	act
ton	hate	lime	real
in	ion	cat	meal
tan	he	rat	heal
ten	him	mice	teal
	her	me	on

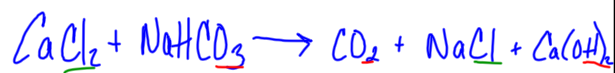
Products
(molecules)

Reactants

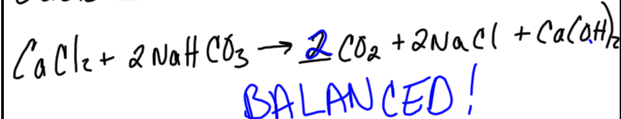
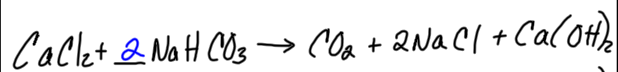
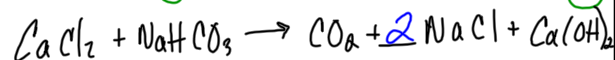
Possible Products →
 H_2O $CaCl_4$ 

Signs of a Chemical Reaction

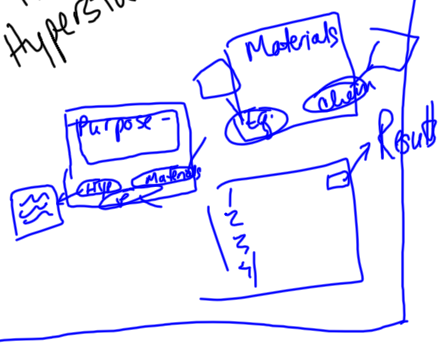
1. foam/bubbles - gas formation
2. changing color - could also indicate pH change
3. temperature change -
 heats up \uparrow exothermic - Energy Released
 cools down \downarrow endothermic - Energy Absorbed



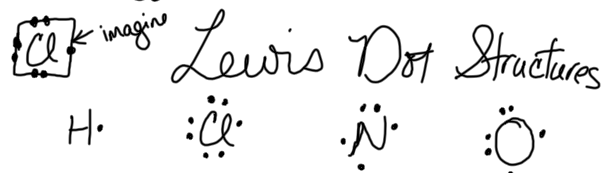
Something is wrong - Unbalanced!!



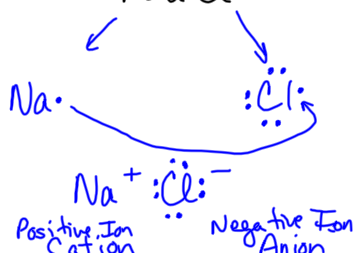
How to think
about Hyperstudio.



Chemical Bonding -
only involves valence
electrons



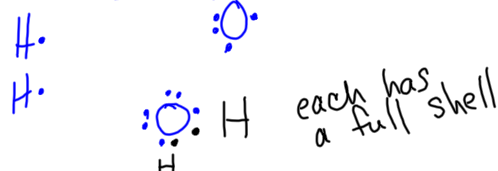
Ionic Bond
Sodium chloride
NaCl

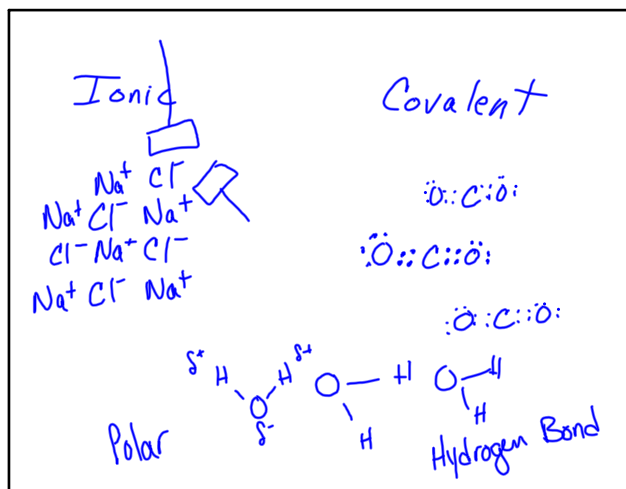


Covalent Bond

everyone shares
electrons

H₂O ← Chemical Formula

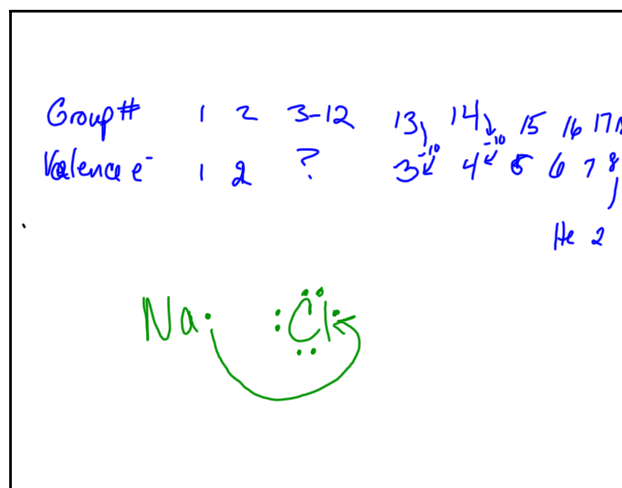
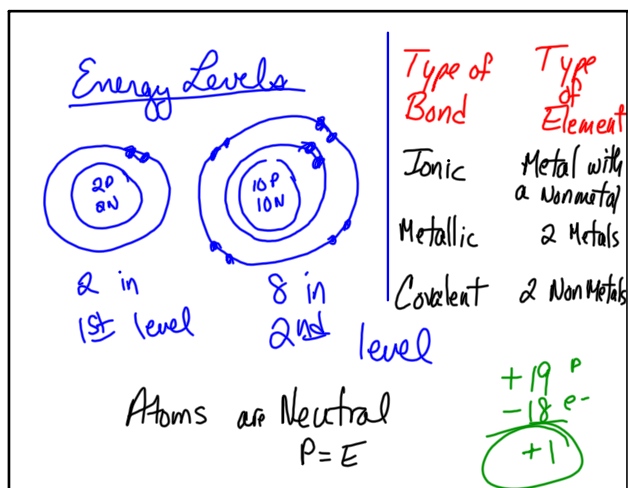
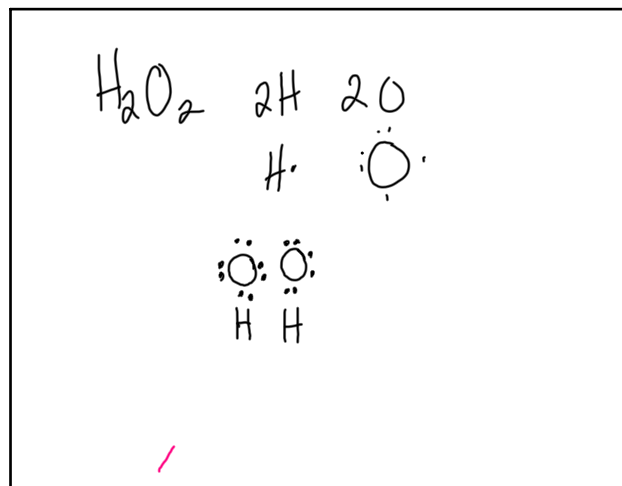
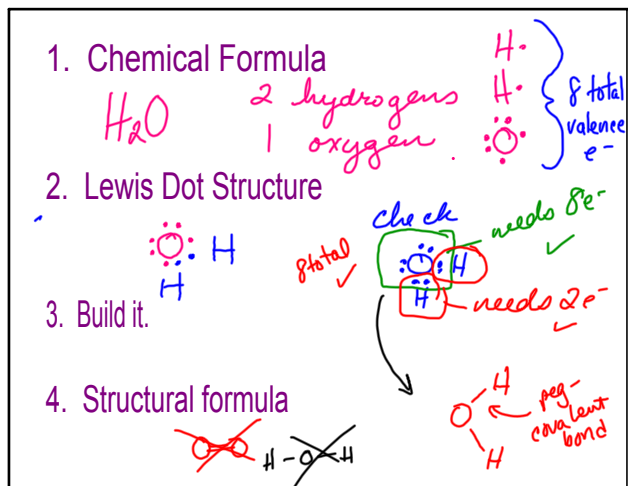




Molecular Model Kit

Stick - 5 Represent shared pairs of e^- (Covalent Bonds)

Holes on Atoms - Bonding sites



A comparison of the mass of the reactants and the mass of the products of a chemical reaction.

0.5g

$Pb(NO_3)_2$ A B NaI test tube

beaker

balance mass of glassware _____ g
+ .5g
mass of glassware and $Pb(NO_3)_2$ = _____ g

Invert test tubes

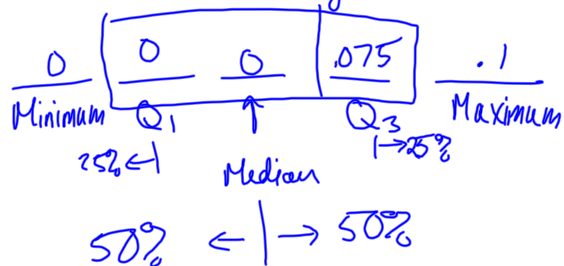
Products

→ — no change
↗ — mass increased
↘ — mass decreased

Mass of reactants	Change in mass (g)						
	Table 1	Table 2	Table 3	Table 4	Table 5	Table 6	Mean
1.0g (0.5g of each reactant)	0.0	+0.1	+0.1	0.0			
2.0g (1.0g of each reactant)	0.0	+0.05	0.0	0.0			
3.0g (1.5g of each reactant)	+0.1	+0.05	0.0	0.0			
4.0g (2.0g of each reactant)	0.0	+0.1	0.0	0.0			

1. Strong Statement - Trend!
Variation Relationship
Central Tendency (Mean, Median, Mode)

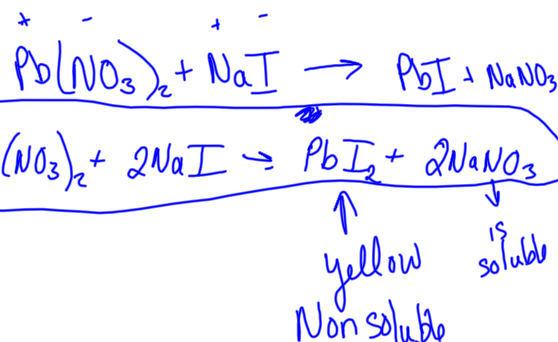
5-Number Summary



$IQR = Q_3 - Q_1 = .075$
The Law of Conservation of Mass

3. Interpretation

Mass - Atoms
Concepts { Chemical Reaction
Rearranging Atoms
Signs of a Reaction
Apply to Lab



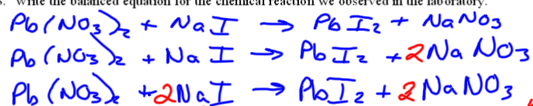
Lead Nitrate Post Lab

1. In this experiment we used the compounds Lead Nitrate, Pb(NO₃)₂, and sodium iodide, NaI. These are both Ionic compounds.
2. When ionic compounds dissolve, the ions separate from each other and spread throughout the solution. solid for for med
3. When the two solutions were combined, we saw the following evidence that a chemical reaction had taken place:

4. The reaction was a double replacement reaction because the ions in two ionic compounds traded places with each other. Pb(NO₃)₂ NaI
5. The reactants in this reaction were Sodium iodide and Lead nitrate
6. The products in this reaction were Sodium nitrate and Lead iodide
7. We found that the mass of the products was equal to the mass of the reactants. This is a demonstration of the law of Conservation of Mass

Reactants → Products

8. Write the balanced equation for the chemical reaction we observed in the laboratory.



Balanced - Actual

9. Sodium nitrate is soluble in water so its ions remained in solution. Ratios of Chemicals
10. Lead iodide is insoluble in water so it formed a solid and came out of solution.
- This solid is called a precipitate.

filtrate

→ residue on filter paper